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THE USE OF THE MODIFIED HAND TEST AND PICTORIAL STUDY OF VALUES TO DIFFERENTIATE BETWEEN SUCCESSFUL AND UNSUCCESSFUL EDUCABLE MENTALLY RETARDED WORK-STUDY STUDENTS

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RUSSELL ALLEN HARDESTY
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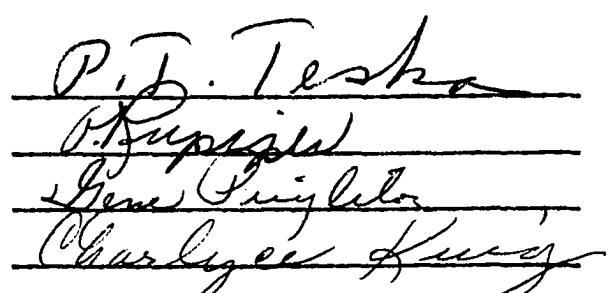
1973

THE USE OF THE MODIFIED HAND TEST
AND PICTORIAL STUDY OF VALUES
TO DIFFERENTIATE BETWEEN SUCCESSFUL AND UNSUCCESSFUL
EDUCABLE MENTALLY RETARDED WORK-STUDY STUDENTS

APPROVED BY



DISSERTATION COMMITTEE

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TABLE OF CONTENTS

		Page
ACKNOWLEDGMENTS		iii
LIST OF TABLES		v
Chapter		
I.	INTRODUCTION	1
	Review of the Literature	4
	Statement of the Problem	13
	Hypotheses	13
II.	METHOD	15
	The Subjects	15
	The Procedures	16
	The Instruments	16
	The Scoring	21
III.	RESULTS	23
IV.	DISCUSSION	35
V.	SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS	38
	Summary	38
	Conclusions	39
	Recommendations for Further Study	40
REFERENCES		41
ADDITIONAL RESOURCES		45
APPENDIX A		47
APPENDIX B		56
APPENDIX C		58

LIST OF TABLES

Table		Page
1.	Composition of Groups	24
2.	The Median Test for Responses Given on the Modified Hand Test By Successful and Unsuccessful Work-Study Students - Results of the Chi-Square . .	27
3.	The Median Test for Scores on the Pictorial Study of Values By Successful and Unsuccessful Work-Study Students - Results of the Chi-Square . .	28
4.	The Median Test for ACT Responses Given on the Male-Female-Child Stimulus Cards of the Modified Hand Test By Unsuccessful Work-Study Students - Results of the Chi-Square . .	30
5.	The Median Test for ACT Responses Given on the Male-Female-Child Stimulus Cards of the Modified Hand Test By Successful Work-Study Students - Results of the Chi-Square	30
6.	Median and Quartile Ranges for the ACT Scoring Categories on Male-Female-Child Stimulus Cards for Successful and Unsuccessful Work-Study Students	31
7.	Medians and Quartile Ranges for Scoring Categories of the Modified Hand Test For Successful and Unsuccessful Work-Study Students	32
8.	Medians and Quartile Ranges for the Scales of the Pictorial Study of Values For Successful and Unsuccessful Work-Study Students	33
9.	Correlations for ACT, PATH, and $(1 - \frac{INT}{ENV})^2$ of the Modified Hand Test and the Pictorial Study of Values	34

Table		Table
10	Descriptive Information for Successful Subjects . .	47
11	Descriptive Information for Unsuccessful Subjects .	48
12	Item Analysis of Responses on the Modified Hand Test - Successful Subjects	49-50
13	Item Analysis of Responses on the Modified Hand Test - Unsuccessful Subjects	51-52
14	Scores of Successful Work-Study Students on the Pictorial Study of Values.	53
15	Scores of Unsuccessful Work-Study Students on the Pictorial Study of Values	54
16	Analysis of Male, Female and Child Cards and ACT Scoring Category on the Modified Hand Test Successful and Unsuccessful Subjects	55

THE USE OF THE MODIFIED HAND TEST AND PICTORIAL STUDY OF VALUES TO DIFFERENTIATE BETWEEN SUCCESSFUL AND UNSUCCESSFUL MENTALLY RETARDED WORK-STUDY STUDENTS

CHAPTER I

INTRODUCTION

Each year a considerable amount of money and effort is spent on the vocational training of the educable mentally retarded (EMR) in our public schools. Quite often this money and effort is spent with little knowledge of the potential employability of the mentally retarded student. Frequently, vocational plans are undertaken only on the basis of known or assumed vocational aptitudes and with little knowledge of the student's psychological needs as related to successful employment. A student may have the manual dexterity needed to be a successful worker on an assembly line but lack the emotional maturity needed to receive criticism, respect authority figures and/or socially relate with fellow employees.

Vocational tests fail to indicate the likelihood of success on a job past the ability to physically perform the tasks needed for a particular job. According to Walker (1951) psychological tests that predict vocational adjustment include paper and pencil tests of personality, intelligence, aptitude and interest; however, these often require at least a fifth grade reading level. Consequently, this reading level eliminates the practical use of these tests for the retarded. Walker (1951) felt that those tests which hold the most promise as predictors of vocational success are individual intelligence and projective personality tests.

In a study by Manus (1970) an attempt was made to predict vocational success by skill analysis prior to training and placement. The skill analysis was able to predict successful training completion but failed to predict successful job adjustment. Manus concluded that trainability was a composite of skill potential and personal-social adjustment. Clark (1970) in a review of the efforts of Weingarten, Parnicky, Geist and Becker to develop pictorial vocational interest tests pointed out that little has been done to develop tests that predict success for the EMR other than ability and/or interest. To date, there have been no tests that have been developed to predict the employability of the EMR student.

The EMR students enter their vocational training program in the public schools at the beginning of the tenth grade. Along with their academic work, these students are assigned to various work stations from which to gain work experience. By the time they graduate from high school they are expected to have obtained a marketable skill. Warren (1955) indicated that the placement problem of the mentally retarded include social incompetency, emotional immaturity, academic weakness, motor incoordination, and a host of personality inadequacies. The students experience failure and frustration on the job because they are not able to psychologically handle the demands of meeting and working in the public. This frustration and failure most often causes the Work-Study student to fail to gain a vocational skill with which to support himself after graduation.

There exists a need to evaluate the psychological needs of the EMR Work-Study student in order to determine appropriate and success-oriented work stations. The EMR student is differentiated from the institutionalized and sheltered workshop student by the higher level of community involvement in which he finds himself. The student is expected to deal with the general public and to be able to handle the multitude of interpersonal problems that he encounters. At the present

time, the teacher-coordinator and vocational counselor that work with these students are expected to vocationally assess and successfully place these students on jobs. Cowan and Goldman (1959) showed that mentally retarded subjects who had training were significantly more successful than were the untrained. This points out the need for selective placement for the EMR Work-Study student. As indicated by Able (1940) one of the most important factors of success is careful placement in a job which is fitted to the psychological needs and ability of the retarded individual. Many hours and perhaps the entire vocational training program for an individual could be saved if there were an instrument/or instruments that could be administered to help in the proper vocational placement of these students.

The use of vocational interest tests have failed to successfully predict employability for the EMR student. This task seems to be left to the use of projective techniques and other personality evaluation type tests. The use of a projective test and a non-projective study of personal values will be utilized in this study to determine these tests' ability to differentiate between successful and unsuccessful EMR Work-Study students.

A projective technique, the Hand Test, developed recently by Edwin E. Wagner has been used in research to successfully differentiate successful and unsuccessful workers in institutions and sheltered workshops. (Wagner and Copper, 1963; Wagner and Hawver, 1965; Wagner and Capotosto, 1966). The Modified Hand Test (Shinder, 1973) will be used in this study as opposed to the Wagner version.

A non-projective, non-reading test, the Pictorial Study of Values (PSV) has been developed by Charles N. Shooster. This test has been successfully employed to differentiate between engineers, salesmen, and sales managers. However, no research has been done to determine if the test can be used to differentiate between successful and unsuccessful EMR Work-Study students. The major purpose of this research is to

determine if the Modified Hand Test and the Pictorial Study of Values can be used to differentiate between successful and unsuccessful educable mentally retarded Work-Study students.

Review of the Literature

The use of projective techniques in predictive problems should be based on established psychological need and the patterns of impulse-control which are helpful or which are a hinderance in a given field (Korner, 1950). After the establishment of these needs the projective test can be helpful.

Bolduc (1960) in his study of the social value need patterns of institutionalized and non-institutionalized mental retardates stated that there are six definable factors related to social needs:

> Factor I stressed a passive, compliant approach to authority figures with responsibility being the most dominant value orientation. Factor II emphasized loyalty and the protection of others with loyalty being the most dominant value orientation. Factor III was tentatively defined as a preference for submission in situations involving authority figures but with more assertive behavior in relationships with peer groups. Factor IV stressed honesty and moral courage, suggesting an assertive, dominant individual who prefers to participate in the correction of the misbehavior of others. Factor V emphasized the need to be dominant in relationships with peer groups. Values are recognized, but are frequently distorted and employed as weapons with which to gain dominance. Factor VI stressed a negative, rebellious approach to social situations involving authority figures with an underlying need for affection and pleasurable activities dominating behavior.

Jackson and Butler (1963) found that institutionalized mentally retarded individuals successfully placed in the community are able to resolve conflict situations by compliance and submission to adults and maintain an assertive relationship with peers. Shafter (1957) in another study of the characteristics of successfully placed institutionalized mental defectives found that good behavior, non-escapism, non-quarrelsomeness, non-aggressiveness, truthfulness, obedience,

carefulness, non-punishment and non-stealing differentiated between successfully and unsuccessfully placed mental defectives.

Warren (1961) in a study of employed and unemployed EMR males showed self-confidence, cheerfulness, cooperation with supervisor, cooperation with other employees, respect for supervisor, minding own business, mixing socially with other employees, completing work on time, quality of work, understanding work and initiative were significant at the .05 level of confidence in favor of the employed group.

Tizard and O'Connor (1950) showed that the job adjustment of the high-grade defective (EMR) was little different from low grade normal (I.Q. 90 - 75 $\pm$ 3) adolescents. The study concludes that the EMR is subject to boredom, monotony, emotional instability as the low grade normal is. These conclusions were reached on a population studied in England in a highly industrialized setting.

A study by Able (1940) of a group of mentally retarded girls who were employed successfully in the community indicated that a stable home, ambition, self-respect, careful job placement, and careful guidance during the initial work period were the most significant factors related to their success.

One of the newest projective techniques, the Hand Test was developed by Wagner in 1959. The rationale for the Hand Test was developed from Wagner's desire to observe the finer aspects of the Rorschach M (human movement) responses. His first published study attempted to differentiate schizophrenics from normals (1961). In 1962, a monograph, The Hand Test: A New Projective Test With Special Reference to the Prediction of Overt Aggressive Behavior by Bricklin, Piotrowski, and Wagner provided the rationale and scoring system for the Hand Test.

Wagner (1961) found that the Hand Test was able to differentiate between a normal group and a schizophrenic group with a statistical significance of .001 for the ACTivity, INTerpersonal, MALadjustment,

and WITHdrawal categories. The WITH category produced a correlation of .81 between the presence of withdrawal responses and schizophrenia. In a study with neurotics and schizophrenics (Wagner, 1962) with WITH score proved to be the most discriminating score between the two groups (.001 level of confidence). Wagner and Medvedeff (1963) found that the Acting Out Score (AOS) ((AGG + DIR) - (AFF + DEP + COM)) permitted a correct placement of 71 percent of the aggressive schizophrenics in a study done with aggressive and non-aggressive schizophrenics. Wagner (1963) also found that the sub-categories of the Hand Test, SEX e.g. "Feeling a woman's breast" (Wagner, 1962, p. 28) and CYLindrical, e.g. "percepts involving contact with cylindrical objects or manipulation of cylindrical objects", could differentiate overt psychosexual maladjustment in neurotic males at the .02 level of confidence. Differentiation was correct in 72.5 percent of the cases. However, in a study by Drummond (1966) the Hand Test failed to discriminate aggressive schizophrenics, thus leaving some doubt as to the usefulness of the Hand Test with schizophrenics and neurotics.

The Hand Test also has been shown to be an evaluative tool with delinquents. Wagner and Hawkins (1964) were able to successfully differentiate aggressive from non-aggressive delinquents ranging in age from 10 to 17. The AOS was able to differentiate beyond the .001 level of confidence. The AOS differentiated 47 out of 60 subjects. A study by Brodsky and Brodsky (1967) found that there was a significant difference observed between the mean AOS scores of Ss who had committed crimes against persons and those who committed crimes against property. They found a considerable amount of overlap in the AOS among the avoidance offenders, property offenders and person offenders group and questioned the use of the AOS to predict individual antisocial behavior in confinement. A study by Oswald and Loftus (1967) with Australian adolescent normals and adolescent delinquents indicated that the Acting Out Ratio (AOR) needs to be considered cautiously in

assessing outwardly directed behavior. They also found that the Hand Test correctly differentiated 66 percent of the recidivists from non-recidivists and the AGGression score also successfully differentiated the two groups.

The Hand Test has also been used to predict good workers. To this point, research has only been done with physically and mentally handicapped individuals in sheltered work situations. The Hand Test has been used to predict vocational success because of the necessity of the hands to express one's involvement with his environment:

> It is likely that far more of the associations to a hand involve action tendencies which are readily activated than do associations to an inkblot....responses to the Hand Test are closer to the motor system than are the responses to the Rorschach....action tendencies associated with impersonal processes are far more likely to be elicited by the Hand Test (Bricklin, Protrowski, and Wagner, 1962, p.90).

Wagner said the ACTivity responses of the Hand Test are:

> Environmental responses involving an action or attitude designed to constructively manipulate, attain, or alter an object or good. (Wagner, 1971, p.5)

> ACT responses are the most common of the environmental scores and are given by people who are involved in constructive accomplishment....it is the amount of psychological investment in material achievement.... Successful living requires some attention to and concern with impersonal factors....every normal record should include some ACT responses. Only under exceptional circumstances could an individual procure no ACT responses and remain environmentally efficient. (Wagner, 1971, p.22)

A study in 1963 (Wagner and Copper) found that the ACT score differentiated 45 out of 50 workers at Goodwill Industries in Akron, Ohio. These workers had been rated by their supervisors and the results were significant at the .001 level of confidence. However, Huberman (1964) failed to crossvalidate Wagner and Copper's finding. With 18 subjects classified into three groups of activity levels, the Hand Test failed

to differentiate the groups. Wagner and Hawver (1965) used the ACT score of the Hand Test with seven other tests, to develop one or more test predictors of success in a sheltered workshop. The ACT score of the Hand Test correlated with the criteria beyond the .01 level of confidence. Wagner and Capotosto (1966) extended the research with vocational adjustment with the handicapped with a study of 47 retarded workers at the Lincoln State School in Illinois. The ACT score was used to differentiate 74 percent of the subjects who had been rated "good" and "poor". The results were significant at the .01 level.

These studies have been limited to subjects who were handicapped to the degree that they needed varying degrees of custodial care either in a sheltered workshop or in an institution. There have been no studies of vocational adjustment done with the retarded who have not been institutionalized or involved in a sheltered workshop. This group of educable mentally retarded individuals must compete with the "normal" population for jobs. They find themselves limited to jobs that are basically manual in nature and require very little decision making. This is a realistic limitation when one considers that the educable mentally retarded lack the intellectual capacity to function in the "blue collar" jobs or administrative positions which require an "average" intelligence. In order for the educable mentally retarded person to be successfully employed he needs to be able to relate to the environment. Therefore, an ACT score, as defined by Wagner, may well be an indicator of ability to succeed on a job.

Roe (1956) theorized that occupational choice is based on the function of a person's environmental-interpersonal orientation. This theory was evaluated with the Hand Test by Thornton (1969). Roe's theory proposes that the occupation a person chooses depends on his preference of interpersonal relations or preference for environmental activities. Those who work in industry would tend to prefer environmental activities, whereas, a social worker will tend to prefer interpersonal

relationships. The research generally supported the theory and suggested further studies needed to be made to validate this theory.

The educable mentally retarded student because of his intellectual limitation is most often limited to environmental jobs (manual labor, dishwashing, janitorial). If the Hand Test is sensitive to a person's preference for interpersonal and environmental orientation it should be revealed in the INT and ENV summation categories. If an EMR student has a preference for interpersonal involvement over environmental involvement he might well experience difficulty in vocational adjustment because of needs not suited to the available job market. This difficulty could well be represented in a larger or smaller INTerpersonal than ENVironmental score, whereas, a well-adjusted worker who is educable mentally retarded should have an ENV score more equivalent to the INT score. Likewise, an EMR who had no capacity to relate to people would have considerably fewer INT responses.

Wagner said of the ENV-INT responses:

> ENV responses are assumed to represent generalized attitudes toward the impersonal world, i.e. a readiness to respond to or come to grips with the environment in a characteristic fashion....The Hand Test ....reflects activities which play a natural and major role in everyday living....Occasionally very disturbed individuals....give many ENV responses reflecting an attempt at integration which is achieved through a compulsive and tenacious attachment to "things" rather than to people. On the other hand, neurotics who are overly concerned with and sensitive to the opinions of others, tend to give more INT than ENV. This comparatively low ENV may also reflect the neurotic's inefficiency in the world of work.
>
> Normals give approximately the same number of ENV and INV responses....emphasis on ENV response doesn't necessarily indicate maladjustment provided some INT of good quality are present in the protocol. (Wagner, 1971, pp. 22-23)

Another problem often experienced by the EMR student is failure to experience vocational success, thus producing a feeling of insufficiency and withdrawal from reality. The MAL and WITH scores of the

Hand Test represent the difficulty of carrying out action tendencies and withdrawal from reality:

> MAL connotes apprehension and distress arising from a failure to achieve need satisfaction and is more characteristic of the neurotic than the psychotic....Of course, keeping with the nuclear definition of MAL, any individual who suffers from subjective feelings of insufficiency can produce MAL responses. (Wagner, 1971, p.22)
>
> WITHdrawal Response - The adjusted individual has achieved prototyped behavior patterns which are workable and satisfying; the neurotics adjustive potential has been interferred with by subjective feelings of stress that dampen interpersonal and environmental tendencies. The psychotic, however, has found realistic interaction with people, object and ideas so traumatic, difficult and non-reinforcing that meaningful, effective life roles have been partially or completely abandoned. (Wagner, 1971, p.23)

In the scoring system the WITH and MAL scores are used to formulate a PATH score (PATH = MAL + 2 WITH). This PATH score is an indication of psychopathology in a protocol. It may be assumed that those unsuccessful EMR Work-Study students whose lack of success is due to withdrawal and maladjustment would have a greater PATH score than the successful Work-Study students.

Shinder (1973) developed the Modified Hand Test which increased the number of stimulus cards from ten as contained in Wagner's Hand Test to 30. In this set of 30 cards, ten depict male hands, ten female and ten depict children's hands. Shinder found the Modified Hand Test successfully differentiated bright delinquent from bright non-delinquent adolescents at statistically significant levels. The Acting Out Ratio (AOR) as well as the ACT, EXH, FAIL and BIZ scoring categories differentiated the two groups most successfully. Shinder found that the female stimulus cards elicited more ACT responses than did the male stimulus cards.

Roberts (1971) found that bright children had more responses on the Hand Test than did mentally retarded children. In consideration

of this finding the ten cards of the Hand Test could fail to give the mentally retarded child as many opportunities of response as would the Modified Hand Test. For this reason, the Modified Hand Test has been selected for use in this study.

The Pictorial Study of Values (PSV) by Charles N. Shooster was published in 1957 by Psychometric Affiliates. The PSV measures the values proposed by Spranger (1928) as does the Allport-Vernon-Lindzey Study of Values. In addition to Spranger's Types of Men, the rationale is based on experimental evidence that an individual's perception is influenced by his values. (Postman, Bruner, and McGinnis, 1948; Bruner and Postman, 1947; McGinnis, 1950; Alder, 1944).

The PSV consists of 60 pictures of people engaged in activities which correlate to the six value types (aesthetic, economic, political, religious, social and theoretical) of the Allport-Vernon-Lindzey Study of Values. One hundred subjects were in the standardization of the PSV. Gough (1960) and Baggley (1960) felt the PSV pictures were unattractively grouped, poorly produced and prematurely published. However, they concurred with the idea of assessment of personalogical values by means of pictorial stimuli.

Super (1949) indicated that the Allport-Vernon-Lindzey Study of Values should be used primarily with high school groups in the eleventh and twelfth grades because of the test's required reading level. This limitation prevents the use of the Study of Values with EMR adolescents. However, the use of the PSV which has pictures and instructions that can be read to the individual deserves investigation for possible use with adolescent EMR students.

The norms presented in the PSV manual are weak, using only three male samples of 110, 57, and 41 and only one female sample of 40. The 1962 supplement to the manual provides norms for adults based on 210 males and 100 females ranging in age from 18 to 63, all with some college training. There are no norms for the mentally retarded. The use

of the Allport-Vernon-Lindzey Study of Values is most applicable as a guidance tool (Super, 1949) and the PSV's use is primarily the same.

There appears to be two aspects of the PSV that may be useful in differentiating the EMR Work-Study students, the Economic score and the Genlike score.

Spranger (1928) said of the economic attitude:

> Man and nature are closely interwoven. The preservation of life depends upon natural products and forces which are apt to satisfy man's needs. These needs are not constant but increase with his development. Even after the most urgent have been satisfied his wants grow until he is finally satisfied. But this point is seldom or never reached. The capacity of natural products to satisfy needs (by maintaining and developing a physical life) is called their utility. The useful is thus always a physical means to satisfy needs. We shall accept without further discussion the fact that the maintenance of life by means of appropriate adjustment to given conditions is the aim of the process (economic).

The economic attitude is similar to the ACTivity concept of Wagner's Hand Test. Using a similar rationale the Work-Study student, because of his mental limitations, is most often vocationally limited to dealing with the physical environment (i.e. food service, light factory, manual labor, housekeeping).

The second aspect of the PSV that may be capable of differentiating between successful and unsuccessful EMR Work-Study students is the Genlike score. The development of the Genlike score is based on E.L. Thorndike's observation that individuals responding in interest and rating studies tended to distribute themselves randomly according to "strength of liking things in general". He called this genlike. It is probably indicative of general vigor and drive or a "lust for life" (Shooster, 1957). The EMR Work-Study student, in order to succeed, will also need an ability to relate to people as well as to the environment. The Economic and the Genlike scores should be able to differentiate between the successful and unsuccessful EMR Work-Study students.

Statement of the Problem

The problem of this study is to determine if the ACT scoring category, the PATH summation category and the INT/ENV ratio of the Modified Hand Test and the Economic and Genlike categories of the Pictorial Study of Values can significantly differentiate between the successful and unsuccessful Work-Study students. The ACT score, PATH score and INT/ENV ratio of the Modified Hand Test will each be correlated with the six values and Genlike score on the Pictorial Study of Values.

Definitions

For use in this study the following definitions will be used:

Educable Mentally Retarded Work-Study Student: Those students enrolled in secondary school (grades 10-12) Special Education classes whose I.Q. scores are within the range of $50 - 75 \pm 3$, as specified by the State of Oklahoma.

Teacher Coordinators: Those teachers certified by the State of Oklahoma to teach the educable mentally retarded Work-Study student. The teacher-coordinator spends approximately one-half day instructing the Work-Study student in academic programs and one-half day securing jobs for the students and supervising the students on the job.

Hypotheses

In consideration of the research and findings stated in the preceeding review, the following hypotheses will be investigated:

1) Successful Work-Study students will have a greater number of ACT responses on the Modified Hand Test than will the unsuccessful Work-Study students.

2) Successful Work-Study students will have a smaller INT/ENV $(1 - \frac{INT}{ENV})^2$ ratio on the Modified Hand Test than will the unsuccessful Work-Study students.

3) Successful Work-Study students will have a lower PATH score on the Modified Hand Test than unsuccessful Work-Study students.

4) Successful Work-Study students will have a higher Economic score on the Pictorial Study of Values than will the unsuccessful Work-Study students.

5) Successful Work-Study students will have a higher Genlike score on the Pictorial Study of Values than will the unsuccessful Work-Study students.

CHAPTER II

METHOD

The Subjects

A sample of 50 students placed in secondary Work-Study programs for the educable mentally retarded were used in this study. They were selected from 250 EMR students in eight public high schools in the greater Oklahoma City, Oklahoma area. The three suburban high schools were Choctaw, Crooked Oak and Western Heights. Five high schools were chosen to represent each geographic sector: Northwest Classen (Northwest), U.S. Grant (Southwest), Southeast (Southeast), Star Spencer (Northeast) and Douglas (Central).

Each subject except two fell into the EMR I.Q. range (50 - 75 $\pm$ 3). These two exceptions were placed in the class for the EMR on a cover letter by a certified psychometrist because they were functioning in the EMR range both socially and academically. Each subject was within the age range of 15 to 19 (successful mean age = 17, unsuccessful mean age = 16.4). They were all in the tenth, eleventh and twelfth grades in high school. Each student was physically capable of working at a job and had been enrolled in the Work-Study program at least one month. The subjects were selected and tested during the final quarter of the school term 1972-73 to insure a minimum of student transfers and to insure the teacher coordinator's knowledge of their students' work experience. All of the geographic areas of the Oklahoma City area were selected to insure a good sampling of various socio-economic levels.

The Procedures

Each teacher-coordinator of the selected high schools was asked to rate the students who were physically able to work and in grades 10-12 from most successful to least successful. (See letter and rating form sent to the teacher coordinator - Appendix B). The teacher coordinators filled out the rating form listing their students in descending order most successful to least successful giving name, age, sex, race and I.Q. The criteria for rating the Work-Study students was adapted from Warren (1961).

A total of 250 subjects were listed on the rating forms. The upper ten percent of the subjects from each school were placed in the successful workers group and the lower ten percent of the subjects from each list were placed in the unsuccessful group of subjects.

The Modified Hand Test and Pictorial Study of Values were administered by a certified psychometrist who had experience with the Hand Test's administration and scoring. Only one examiner was used to insure uniformity of testing and scoring of the Modified Hand Test. The PSV was given during the same visit.

The instructions and scoring procedures used for the Modified Hand Test was the same as used in Wagner's manual. The instruction "what might this hand be doing" was used and the first response to each stimulus card was scored.

The PSV was given in a group setting in the individual high schools with the examiner reading the instructions for the PSV and answering any questions about the instructions the subjects had.

The Instruments

The Modified Hand Test as developed by Shinder (1973) included 30 drawings of hands, ten male, ten female and ten children's hands. These hands are comparable to Wagner's nine original hand drawings

in line composition, gesture and size. Shinder's Modified Hand Test used the same scoring system as did Wagner. The average administration time for the Modified Hand Test was 15 to 20 minutes. Each response was categorically scored as one of the following as defined by Wagner (1971):

Affection (AFF): Interpersonal responses involving an interchange or bestowment of pleasure, affection or friendly feeling, e.g. "Waving to a friend--a greeting."

Dependence (DEP): Interpersonal responses involving an expressed dependence on or need for succor from another person, e.g. "A drowning person calling for help."

Communication (COM): Interpersonal responses involving a presentation or exchange of information, e.g. "Talking with your hands."

Exhibition (EXH): Interpersonal responses which involve displaying or exhibiting oneself in order to obtain approval from others or to stress some special noteworthy characteristic of the hand, e.g. "A minstral man--dancing."

Direction (DIR): Interpersonal responses involving influencing the activities of, dominating, or directing others, e.g. "Teacher sending a child to the board."

Aggression (AGG): Interpersonal responses involving the giving of pain, hostility, or aggression, e.g. "Grabbing someone with violence."

Acquisition (ACQ): Environmental responses involving an attempt to acquire or obtain a goal or object. The movement is ongoing and the goal is as yet unobtained and, to some extent, still in doubt, e.g. "Kid trying to get into the cookie jar."

Active (ACT): Environmental responses involving an action or attitude designed to constructively manipulate, attain, or alter an object or goal. ACT responses are distinguished from ACQ responses in that the object or goal has been, or will be, accomplished and the issue is therefore not in doubt, e.g. "Threading a needle."

Passive (PAS): Environmental responses involving an attitude of rest and/or relaxation in relation to the force of gravity, and a deliberate and appropriate withdrawal of energy from the hand, e.g. "Just resting."

Tension (TEN): Energy is being exerted but nothing or little is accomplished. A feeling of anxiety, tension or malaise is present. TEN responses also include cases where energy is exerted to support oneself against the pull of gravity accompanied by a definite feeling of strain and effort, e.g. "Holding something very tight."

Crippled (CRIP): Hand is crippled, sore, dead, disfigured, sick, injured or incapacitated, e.g. "Looks sorta deformed."

Fear (FEAR): Responses in which the hand is threatened with pain, injury, incapacitation, or death. A FEAR response is also scored if the hand is clearly perceived as meting out pain, injury, incapacitation, or death to the subject or to a person with whom the subject identified, e.g. "Trembling....it's frightened by something."

Description (DES): Subject can do no more than acknowledge the presence of the hand with perhaps a few accompanying inconsequential descriptive details or feeling tones, e.g. "Just a hand."

Bizarre (BIZ): A response predicated on hallucinatory content, delusional ideation or other peculiar, pathological

thinking. The response partially or completely ignores the drawn contours of the hand and/or incorporates bizarre, idiosyncratic, or morbid content. One genuine BIZ response is pathognomic of serious disturbance, e.g. "A crocodile creeping along the wall."

Failure (FAIL): Subject can give no scorable response whatsoever to a particular card. A FAIL is tabulated in computing summary scoring, but is not included in the response total, R, since it is not really a response but a failure to respond.

There are four summation symbols which represent combinations of the symbols just defined. Wagner (1971) defined these as:

Interpersonal (Σ INT): AFF, DEP, COM, EXH, DIR, and AGG are combined for INT responses. That is, those responses involving relations with other people....an absence or dearth of INT always has a negative connotation.

Environmental (Σ ENV): ACQ, ACT, and PAS are combined for Σ ENV responses. They are assumed to represent generalized attitudes toward the impersonal world, i.e. a readiness to respond to or come to grips with the environment in a characteristic fashion.

Maladjustive (Σ MAL): TEN, CRIP, and FEAR are combined for MAL responses. They represent difficulty, of which the individual is at least partially aware, in successfully carrying out various action tendencies, and failure to achieve need satisfactions.

Withdrawal (Σ WITH): DES, FAIL, and BIZ are combined for WITH responses. They represent those who have found realistic interaction with people, objects, and ideas so traumatic, difficult, and non-reinforcing that

meaningful, effective life-roles have been partially or completely abandoned.

For the purpose of this study the ratio for INT and ENV was expressed as $(1 - \frac{INT}{ENV})^2$. In order to handle the data in a rank order correlation there must be a starting point of zero, therefore, the $\frac{INT}{ENV}$ ratio is subtracted from one and squared to dispose of negative values.

Wagner said of the PATH score:

> The PATH score,....is a convenient approximation of amount of psychopathology in a record. PATH must not be interpreted too rigidly, since other quantitative and qualitative indices can indicate of psychological disturbance even when PATH is low; but, by and large, PATH provides suitable benchmarks for assessment of degree of pathology.

The Pictorial Study of Values measured the values defined as follows:

Aesthetic - emphasis on the cultural, beautiful; attention to forms of life experience, typified by interest in art, music, stage.

Economic - desire to create in a material way, to produce, manufacture; interest in the useful, immediate, practical.

Political - desire to lead, to direct, administer, supervise, and control; deal realistically, attain power.

Religious - spiritual emphasis in life experience, recognition of pervading superior power, sanctity of purpose in life.

Social - desire to be with others, sympathize with, to aid and have strong compassion, to relate in a very helpful manner.

Theoretical - desire to deal with ideas, avoid emotionality, deal objectively, emphasize rationality, systematize.

The Genlike score of the PSV is proposed to be an indicator of "lust for life". The Genlike score is the total number of d and e answers made on the Answer Sheet. The d and e answers are those which the subject would like most to be doing.

The administrator of the PSV in giving the instructions, after the subjects have recorded their names and other information, says:

> Please write only on the Answer Sheet. You will notice the column of letters on the left side of the Answer Sheet. The Directions printed on the Answer Sheet explain how to give your answers. Look at them while I read them aloud to you.
>
> The instructions on the Answer Sheet are:
>
> You are looking at pictures of things that people have done. Look at Picture Number 1 and decide how much you would like to engage in that activity. Find Item 1 at the top-left corner of this Answer Sheet, and encircle the letter which shows how much you like the activity pictured in Picture Number 1. You will encircle "e" for the pictures you like best, "d" for those you like next best, "c" for the ones you have no opinion about, "b" for those you have less-than-average opinion of, and "a" for those pictured activities that you have little or no liking for.
>
> For example: if you dislike the activity in Picture Number 1, you should draw a circle around the "a" on Line 1 of this Answer Sheet, like this:
>
> 1. a b c d e
>
> Now: draw a circle around your real rating for Item 1 at the upper-left of this page, and then look at and rate each of the other pictures.

The Scoring

The protocol for each Modified Hand Test was scored by the psychometrist who had no knowledge of the hypotheses being tested. The scoring problems of the Modified Hand Test were much the same as were the problems cited by Oswald and Loftus (1967) in making a decision whether to use the ACT or ACQ, the:

> ....distinction was largely arbitrary. They (authors) now place little confidence in the assumed significance

> of the ACQ scores. The authors found difficulties consistently associated with the distinction to be made between DIR, or ACT or COM (p. 67)

To insure the greatest consistency of scoring only one examiner and scorer was used. The manual was strictly adhered to in scoring to further insure consistency and to eliminate scoring error due to error in memory.

The PSV was cumbersome and difficult to score. It took about 15 minutes to score each Answer Sheet. This researcher felt that the scoring system needed to be made more convenient. The scoring of the PSV is objectively scored and was scored twice by the researcher to correct for any errors.

CHAPTER III

RESULTS

This study was conducted to determine if the ACT, PATH, and INT/ENV ratio of the Modified Hand Test and the Pictorial Study of Values could differentiate between successful and unsuccessful educable mentally retarded Work-Study students. This research was conducted because there were no instruments available to differentiate between successful and unsuccessful EMR Work-Study students. A total of 50 subjects were administered the Modified Hand Test and Pictorial Study of Values.

Twenty-five successful EMR Work-Study students completed the Modified Hand Test and PSV. The mean chronological age was 17 years; S.D. 1.0 years. The mean I.Q. was 74.5; S.D. 7.85. (See Table 1). Twenty-five unsuccessful EMR Work-Study students completed the Modified Hand Test and the PSV. The mean age for this group was 16.4 years; S.D. .97. The mean I.Q. was 68.7; S.D. 7.41 (See Table 1).

An analysis was made of each subject's responses on the Modified Hand Test and PSV before any statistical tests were applied to the data. (See Tables 12, 13 - Appendix A). Medians and quartile ranges ($Q_3 - Q_1$) for both the Modified Hand Test and the PSV (Tables 7, 8) were calculated since the statistical data originally presented by Wagner was in the same statistical form. The formula from Garrett (1956) to calculate a median from a frequency distribution was used.

The Median Test (Siegel, 1956) was used to test for significant differences among the two groups for each scoring variable of the

TABLE 1

COMPOSITION OF GROUPS

		Successful	Unsuccessful
Chronological Age	$\bar{x}$	17.0	16.4
	S.D.	1.00	.97
I.Q.	$\bar{x}$	74.5	68.7
	S.D.	7.85	7.41

Modified Hand Test and PSV. This test was chosen because the data were not normally distributed and the sample sizes were small. Yates' correction for continuity was used (Furgeson, 1959) in the Chi-square formula. This correction was applied for 1 degree of freedom.

Hypothesis 1 stated that successful Work-Study students would have a greater number of ACT responses on the Modified Hand Test than would the unsuccessful Work-Study students. The successful subjects gave more ACT responses (Mdn = 4.8) than did the unsuccessful subjects (Mdn = 3.1). The successful workers gave significantly more ACT responses (chi-square = 5.12, df = 1, $p < .05$, significant). Hypothesis 1, as stated, was positive. Successful EMR Work-Study students gave a greater number of ACT responses on the Modified Hand Test than did the unsuccessful EMR Work-Study students.

Hypothesis 2 stated that successful EMR Work-Study students would have a smaller $(1 - \frac{INT}{ENV})^2$ on the Modified Hand Test than the unsuccessful EMR Work-Study students. The successful subjects' median $(1 - \frac{INT}{ENV})^2$ (Mdn = .28) was less than the unsuccessful subjects (Mdn = .66). The ratio was significantly lower for the successful workers than for the unsuccessful workers (chi-square = 5.12, df = 1, $p < .05$, significant). Hypothesis 2 was positive and was accepted as stated; successful EMR Work-Study students had a lower $(1 - \frac{INT}{ENV})^2$ on the Modified Hand Test than did the unsuccessful EMR Work-Study students.

Hypothesis 3 stated that the successful EMR Work-Study students would have a lower PATH score on the Modified Hand Test than would the unsuccessful EMR Work-Study students. The median PATH score (Mdn = 11.3) was lower for the successful subjects than the medians for the unsuccessful subjects (Mdn = 16.7). The difference was not significant between the successful and unsuccessful workers (chi-square = 1.28, df = 1, $p > .05$, not significant. Hypothesis 3 was negative and was rejected; successful EMR Work-Study students did not have a

lower PATH score on the Modified Hand Test than the unsuccessful EMR Work-Study students.

Hypothesis 4 stated that successful EMR Work-Study students would have a higher Economic score on the Pictorial Study of Values than would the unsuccessful EMR Work-Study students. The median score for the successful workers (Mdn = 26.7) was higher than the median score for the unsuccessful workers (Mdn = 24.3). However, the difference in the Economic score of the Pictorial Study of Values was not significantly higher for the successful workers (chi-square = .72, df = 1, $p > .05$, not significant). Hypothesis 4 was negative and was rejected as stated; successful EMR Work-Study students do not have higher Economic scores on the PSV than unsuccessful EMR Work-Study students.

Hypothesis 5 stated that successful EMR Work-Study students would have higher Genlike scores than would unsuccessful EMR Work-Study students. The median Genlike score (Mdn = 16.8) for the successful subjects was lower than the unsuccessful subjects (Mdn = 21.3). The Genlike scores difference between the successful and unsuccessful students was not significant, (chi-square = 2.00, df = 1, $p > .05$, not significant). Hypothesis 5 was negative and was rejected; successful EMR Work-Study students did not have higher Genlike scores on the PSV than unsuccessful EMR Work-Study students.

Median tests were applied to the remaining scoring categories. (See Table 2). The MAL scores for the successful workers was significantly higher (chi-square = 3.93, df = 1, $p < .05$, significant). The AFF scoring category approached significance (chi-square = 2.89, df = 1, p .10). The remaining scoring categories did not approach significant levels.

The Median Test was applied to the remaining values of the PSV (See Table 3). The Theoretical value was found to differentiate between the successful and unsuccessful groups (chi-square = 3.93, df = 1,

TABLE 2

THE MEDIAN TEST FOR RESPONSES GIVEN ON THE MODIFIED HAND TEST
SUCCESSFUL AND UNSUCCESSFUL WORK-STUDY STUDENTS
RESULTS OF THE CHI-SQUARE
(df = 1)

Scoring Categories	Successful - Unsuccessful (N=25) (N=25)	p
AFF	2.89	NS
DEP	.10	NS
COM	2.08	NS
EXH	.09	NS
DIR	1.66	NS
AGG	.75	NS
INT	1.29	NS
ACQ	.32	NS
ACT	5.12	.05
PAS	2.03	NS
ENV	1.29	NS
TEN	.08	NS
CRIP	.17	NS
FEAR	.00	NS
MAL	3.93	.05
DES	.00	NS
FAIL	.99	NS
BIZ	.10	NS
WITH	.00	NS
PATH	1.28	NS
AIRT	.00	NS
$(1 - \frac{INT}{ENV})^2$	5.12	.05

TABLE 3

THE MEDIAN TEST FOR SCORES ON THE PICTORIAL STUDY OF VALUES BY SUCCESSFUL AND UNSUCCESSFUL WORK-STUDY STUDENTS RESULTS OF THE CHI-SQUARE
(df = 1)

Scale	Successful - Unsuccessful (N = 25) (N = 25)	p
Aesthetic	.32	NS
Economic	.72	NS
Political	.32	NS
Religious	.32	NS
Social	2.00	NS
Theoretical	3.93	.05
Genlike	2.00	NS

$p < .05$, significant). The successful group had a higher median (Mdn = 45.1) than did the unsuccessful group (Mdn = 39.8).

In the study by Shinder (1973) he indicated that the female stimulus cards of the Modified Hand Test elicited more ACT responses than did the male stimulus cards. The ACT responses of the subjects were divided according to which stimulus card elicited the ACT response. Median tests were applied to the data to determine if the female cards elicited significantly more responses than did the Male and Child stimulus cards. The results are reported in Table 4 and 5. The median responses and quartile ranges ($Q_3 - Q_1$) were reported in Table 6. The Female cards elicited significantly more ACT responses than did the Male cards for the successful students (chi-square = 3.93, $p < .05$). The Female/Child and Male/Child comparisons were not significant.

Medians and quartile ranges ($Q_3 - Q_1$) were computed for each of the scoring categories of the Modified Hand Test and the scales of the PSV. These were reported in Tables 7 and 8.

The ACT, PATH, $(1 - \frac{INT}{ENV})^2$ categories of the Modified Hand Test were correlated with each of the six values and Genlike score of the PSV (See Table 9). The Kendall rank correlation, tau, was chosen to test the correlation. This method of correlation was chosen because ordinal measurement had been achieved and both variables (Modified Hand Test categories and values of the PSV) could be assigned a rank. Tau can also be generalized to a partial correlation coefficient (Siegel, 1956). There were many tied ranks in the variables correlated and it was necessary to use the formula for tied observations.

With $N > 10$ tau may be considered to be normally distributed, (Siegel, 1956) and the value of z can be computed to test its significance. Tests of significance on the variables were not significant except for $(1 - \frac{INT}{ENV})^2$ and the Theoretical value (tau = -.254, z = 2.60, $p = .0047$, significant.)

Intercorrelations between the scoring categories of the Modified Hand Test and the values of the PSV were not attempted in this study.

TABLE 4

THE MEDIAN TEST FOR ACT RESPONSES GIVEN ON THE MALE-FEMALE-CHILD STIMULUS CARDS OF THE MODIFIED HAND TEST BY UNSUCCESSFUL WORK-STUDY STUDENTS RESULTS OF THE CHI-SQUARE (df = 1)

Sex of Cards	chi-square	p
Male - Female	2.29	NS
Male - Child	.000	NS
Female - Child	.000	NS

TABLE 5

THE MEDIAN TEST FOR ACT RESPONSES GIVEN ON THE MALE-FEMALE-CHILD STIMULUS CARDS OF THE MODIFIED HAND TEST BY SUCCESSFUL WORK-STUDY STUDENTS RESULTS OF THE CHI-SQUARE (df = 1)

Sex of Cards	chi-square	p
Male - Female	3.93	.05
Male - Child	.73	NS
Female - Child	.75	NS

TABLE 6

MEDIAN AND QUARTILE RANGES FOR THE ACT SCORING CATEGORIES ON MALE-FEMALE-CHILD STIMULUS CARDS FOR SUCCESSFUL AND UNSUCCESSFUL WORK-STUDY STUDENTS

Sex of Card	Successful (N = 25) Median	Q_3-Q_1	Unsuccessful (N = 25) Median	Q_3-Q_1
MALE	.9	1.9 - .6	1.1	1.4 - .6
FEMALE	2.4	3.7 - 1.2	2.3	2.3 - .6
CHILD	2.3	3.1 - 1.0	.7	2.1 - .5

TABLE 7
MEDIANS AND QUARTILE RANGES FOR SCORING CATEGORIES
OF THE MODIFIED HAND TEST
FOR SUCCESSFUL AND UNSUCCESSFUL WORK-STUDY STUDENTS

Scoring Categories	Successful (N = 25) Median	$Q_3 - Q_1$	Unsuccessful (N = 25) Median	$Q_3 - Q_1$
AFF	2.1	3.1 - .9	1.0	4.4 - .6
DEP	.6	1.0 - .3	.7	.8 - .4
COM	1.7	3.4 - .9	1.7	1.9 - .6
EXH	.7	.9 - .4	.7	1.1 - .4
DIR	.8	1.2 - .4	.6	.9 - .3
AGG	2.1	3.3 - 1.2	1.6	2.5 - .8
INT	8.3	11.5 - 6.1	6.0	9.9 - 2.6
ACQ	4.7	6.4 - 2.0	2.8	8.3 - .9
ACT	4.8	8.8 - 3.1	3.1	4.4 - 1.9
PAS	3.0	4.9 - 1.6	1.8	4.1 - .9
ENV	14.0	16.7 -12.8	11.8	15.9 - 6.3
TEN	2.4	3.5 - 1.7	2.8	4.3 - 1.5
CRIP	.7	1.1 - .4	.9	1.3 - .5
FEAR	0.0	.0 - .0	0.0	.0 - .0
MAL	2.8	4.1 - 2.0	4.7	7.8 - 2.4
DES	3.9	6.3 - 1.6	3.6	8.3 - 1.0
FAIL	.6	.9 - .3	.7	1.1 - .4
BIZ	.6	1.0 - .3	.7	1.1 - .4
WITH	4.3	6.4 - 2.1	4.8	10.3 - 2.1
PATH	11.3	15.4 - 8.8	16.7	25.1 -10.8
AIRT	9.1	11.9 - 7.8	9.1	12.4 - 6.6
$(1 - \frac{INT}{ENV})^2$	.28	.67- .06	.66	1.00- .27

TABLE 8
MEDIANS AND QUARTILE RANGES FOR THE SCALES
OF THE PICTORIAL STUDY OF VALUES
FOR SUCCESSFUL AND UNSUCCESSFUL WORK-STUDY STUDENTS

Scale	Successful (N = 25) Median	$Q_3 - Q_1$	Unsuccessful (N = 25) Median	$Q_3 - Q_1$
Aesthetic	53.8	59.8 - 48.6	55.7	62.3 - 51.1
Economic	26.7	29.4 - 23.1	24.3	27.8 - 21.5
Political	47.3	50.9 - 40.6	46.3	50.4 - 43.6
Religious	37.8	41.3 - 35.1	39.8	48.8 - 33.8
Social	35.1	41.9 - 26.6	44.0	50.4 - 33.6
Theoretical	45.1	48.1 - 36.1	39.8	41.4 - 36.0
Genlike	16.8	21.4 - 9.6	21.3	30.9 - 13.6

TABLE 9

CORRELATIONS FOR ACT, PATH, AND $(1 - \frac{INT}{ENV})^2$ OF THE MODIFIED HAND TEST AND PICTORIAL STUDY OF VALUES

PSV	ACT	PATH	$(1 - \frac{INT}{ENV})^2$
Aesthetic	.000	.032	.113
p	NS	NS	NS
Economic	.043	.038	.051
p	NS	NS	NS
Political	.051	-.149	.127
p	NS	NS	NS
Religious	.016	.065	.081
p	NS	NS	NS
Social	.023	.099	.164
p	NS	NS	.05
Theoretical	.027	-.078	-.254
p	NS	NS	.005
Genlike	.016	.017	.040
p	NS	NS	NS

CHAPTER IV

DISCUSSION

Results of this study indicated that caution should be used in attempting to predict the likelihood of vocational success by the Modified Hand Test and the Pictorial Study of Values. Some observations can be made on the different characteristics of successful and unsuccessful EMR Work-Study students.

The ACT scoring category was the only category that significantly differentiated between successful and unsuccessful workers. The successful workers gave more ACT responses than did unsuccessful workers. The ACT category indicates the amount of psychological energy that is available to invest in material achievement. Shinder's (1973) observation that non-delinquent adolescents gave more ACT responses to female stimulus cards than were given for male and child stimulus cards was supported by the successful Work-Study students who gave more ACT responses for the female cards. The unsuccessful workers did not give a significantly larger number of ACT responses for the female cards.

The higher number of ACT responses on the female cards ($p < .05$) than male cards most likely indicates a basic positive relationship that the student had with his mother or mother figure in early childhood. Oswald and Loftus (1967) indicated that the "behavioral tendencies measured by the Hand Test are fixed by age seven" (p. 64). The AFF score which approached significance was also higher for the successful group (successful Mdn = 2.1, unsuccessful Mdn = 1.0). The higher AFF score is indicative of a positive early childhood relationship with the mother or mother figure. Able (1940) found that successfully adjusted

mentally retarded girls in industry came from homes in which the girl had not been rejected to any marked degree. She also found that of 17 unsuccessful girls, 14 came from severely unfavorable homes, homes in which they were rejected by the mother.

The successful Work-Study students had lower MAL scores than did the unsuccessful students. MAL is a summation of TEN, FEAR and CRIP responses given. There was only one FEAR response given by 50 subjects. More TEN and CRIP responses were given by the unsuccessful subjects but were not significantly higher. However, $\sum$ MAL was significantly higher for the unsuccessful workers (successful Mdn = 4.7, unsuccessful Mdn = 2.8). According to Wagner (1971) MAL indicates apprehension and distress as a result of a failure to achieve need satisfaction. Also as the MAL increases the less likely the INT and ENV responses will be acted out. The unsuccessful worker experiences more anxiety about success than does the successful worker.

$\sum$ WITH did not significantly differentiate the groups of workers. The WITH category is comprised of the DES, BIZ, and FAIL scoring categories. Roberts (1971) indicated that mentally retarded students give more DES responses than intellectually bright students. Based on this evidence it is safe to assume that DES responses to the stimulus cards is a function of mental limitation. The WITH category receives double weight in calculating the PATH score (PATH = MAL + 2 WITH), therefore, the MAL category did not appear significant when reported with WITH in the PATH score. MAL appeared to be a more appropriate measure for psychological disturbance that might be present in mentally retarded subjects, and even that must be done with the utmost caution.

The $(1 - \frac{INT}{ENV})^2$ ratio is lower for the successful workers (successful Mdn = .28, unsuccessful Mdn = .66). The score expresses the balance of psychological energy invested in interpersonal relationships and environmental concerns. The smaller the $(1 - \frac{INT}{ENV})^2$ score the more the

subject is aware of interpersonal and environmental surroundings. The successful worker must deal with the environment due to the limitations of vocational choices, and because of his dependence upon other people, must also be able to deal effectively with authoritarian and directive personalities.

The Economic and Genlike scores of the PSV were not able to significantly differentiate between the groups. However, the Theoretical score was able to differentiate between successful and unsuccessful workers. According to Super (1949) individuals who score higher on the Theoretical scale tend to succeed in social and scientific occupations. If the EMR Work-Study students were not highly dependent upon supervisory persons this differentiation would be questioned as a chance differentiation since the job choices of the EMR are limited to manual types. However, considering the dependency of the EMR upon his ability to relate with other individuals to succeed upon a job, this is a consistent finding.

This point is further substantiated by the -.254 correlation between Theoretical/$(1 - \frac{INT}{ENV})^2$ which was significant at the .0047 level of confidence. Hypothesis 3 which was proved at the $p < .05$ level of confidence stated that the successful workers would have a lower $(1 - \frac{INT}{ENV})^2$ on the Modified Hand Test than would the unsuccessful workers. The unsuccessful workers were placed first in the $(1 - \frac{INT}{ENV})^2$ ranking and the successful workers were placed first in the Theoretical category, thereby a negative correlation was obtained.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

This study was conducted to determine if the Modified Hand Test and Pictorial Study of Values could differentiate between successful and unsuccessful educable mentally retarded Work-Study students. A total of 50 subjects were individually administered the Modified Hand Test. The PSV was also administered to each school group. The subjects were enrolled in EMR Work-Study programs in eight high schools of the greater Oklahoma City, Oklahoma area. Twenty-five subjects were in each group. Statistical analysis was applied to each of the scoring categories of the Modified Hand Test and scale of value of the PSV to determine if significant differences existed between the groups. Median and quartile ranges were calculated for each scoring category of the Modified Hand Test and values of the PSV for both groups. The Median Test, with Yates correction for continuity, was used to test for significant differences between the successful and unsuccessful workers. The findings from the evaluations were: 1) Significant differences occurred between the successful and unsuccessful groups in the ACT ($p < .05$); MAL ($p < .05$); and $(1 - \frac{INT}{ENV})^2$ ($p < .05$). 2) Successful workers gave significantly more ACT responses on the female than on the male stimulus cards of the Modified Hand Test. 3) A significant difference between groups occurred for the Theoretical Scale of the PSV, with the successful workers scoring higher ($p < .05$).

The ACT, PATH and $(1 - \frac{INT}{ENV})^2$ of the Modified Hand Test and the six values and Genlike score of the PSV were correlated using Kendall's

rank correlation, tau. A significant correlation was found between $(1 - \frac{INT}{ENV})^2$ and the Theoretical value ($p = .0047$).

Conclusions

Only three aspects of the Modified Hand Test: ACT, MAL, $(1 - \frac{INT}{ENV})^2$ successfully differentiated between the successful and unsuccessful workers.

Successful workers have more psychological energy available to achieve material goals as indicated by higher ACT scores. Early childhood experiences in which the successful worker was accepted probably accounts for the higher number of ACT responses on the female stimulus cards than on male and child cards.

The successful worker had fewer MAL responses which indicates less psychological stress and anxiety. The unsuccessful workers probably experiences more doubts about their ability to succeed than do the successful workers. The successful workers show a more equal awareness of interpersonal relationship and environmental needs than do the unsuccessful workers as evidenced by the lower $(1 - \frac{INT}{ENV})^2$ of the successful worker. This awareness allows the successful worker to depend upon others for guidance on their job.

The awareness of the successful workers dependency on others is supported by their higher Theoretical scores on the PSV. The significant $(1 - \frac{INT}{ENV})^2$ - Theoretical correlation further supported this need.

The Modified Hand Test and PSV cannot be used exclusively to differentiate or predict successful and unsuccessful workers, but could be used in conjunction with experienced personnel to predict and recommend vocational training and habilitation plans to best insure a successful training program and best provide the EMR Work-Study student job placement best suited to his needs.

Recommendations for Further Study

Little research has been done with the Modified Hand Test. The aspect of thirty stimulus cards and sex divisions of the cards provide numerous aspects for future studies.

The scoring of the Hand Test is somewhat too general and is difficult to score some items as a definite category. A research project in which the scoring system would be refined and made less ambigious would be beneficial.

The $(1 - \frac{INT}{ENV})^2$ score could be an additional measure of the Hand Test with which to evaluate personality. It has the potential of presenting a more complete measure of adjustment than do the single scoring categories and deserves additional research.

A more extensive study might be conducted with the PSV to establish norms for use with adolescent EMR students. Also, the PSV might be refined to be more specifically suited for use with the EMR adolescent. The instructions are somewhat difficult for the EMR to understand even when read to him. The pictures are also presented in a confusing manner. Research could also be conducted with different instructions and presentations of the pictures.

There was no control of teacher-coordinator bias in this study. A study might be conducted in which the interpersonal relationship of the teacher-coordinator and Work-Study students affected the vocational success rating. A comparison of the ratings of teacher-coordinators, vocational counselors and employers of the Work-Study students could also be included in the study.

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APPENDIX A

TABLE 10
DESCRIPTIVE INFORMATION FOR SUCCESSFUL SUBJECTS

Subject	Sex	Race*	Age	I.Q.
S-1	M	N	17	72
S-2	M	W	18	80
S-3	F	W	16	79
S-4	M	W	18	94
S-5	M	N	15	72
S-6	M	W	17	76
S-7	F	W	15	99
S-8	F	W	18	70
S-9	M	N	18	68
S-10	M	W	16	75
S-11	M	W	17	77
S-12	M	W	17	68
S-13	F	N	16	72
S-14	M	N	18	62
S-15	F	W	16	76
S-16	M	W	16	79
S-17	M	N	18	75
S-18	M	W	17	71
S-19	M	W	16	77
S-20	M	N	18	75
S-21	M	W	18	70
S-22	F	N	18	64
S-23	M	W	16	74
S-24	M	N	18	69
S-25	M	N	17	70

*W = White
N = Negro

TABLE 11
DESCRIPTIVE INFORMATION FOR UNSUCCESSFUL SUBJECTS

Subject	Sex	Race*	Age	I.Q.
S-26	M	W	18	84
S-27	M	N	16	60
S-28	F	N	16	59
S-29	M	W	16	75
S-30	M	W	17	80
S-31	M	W	16	68
S-32	F	W	16	75
S-33	M	N	16	58
S-34	M	N	17	75
S-35	M	N	15	64
S-36	F	N	16	51
S-37	F	W	15	54
S-38	M	N	16	63
S-39	M	N	16	75
S-40	M	N	16	82
S-41	M	N	17	68
S-42	M	N	18	75
S-43	M	N	17	59
S-44	M	N	15	74
S-45	M	W	17	65
S-46	M	W	16	73
S-47	F	W	16	78
S-48	M	N	17	64
S-49	M	W	19	67
S-50	F	N	15	72

*W = White
N = Negro

TABLE 12

ITEM ANALYSIS OF RESPONSES ON THE MODIFIED HAND TEST

- SUCCESSFUL -

Subj.	AFF	DEP	COM	EXH	DIR	AGG	INT	ACQ	ACT	PAS	ENV	TEN	CRIP	FEAR
S-1	3	1	3	0	5	1	13	7	5	4	16	0	0	0
S-2	0	0	1	1	0	1	3	1	2	9	12	2	3	0
S-3	3	0	12	1	0	2	18	2	1	2	5	3	0	0
S-4	3	1	1	0	1	1	7	8	6	2	16	4	0	0
S-5	5	0	5	0	0	5	15	2	6	0	8	2	0	0
S-6	3	0	1	3	0	1	8	5	4	4	13	7	0	0
S-7	3	0	3	2	1	3	12	3	4	1	8	2	1	0
S-8	2	0	4	0	0	0	6	13	0	4	17	4	1	0
S-9	2	0	4	2	2	2	12	6	10	1	17	1	0	0
S-10	2	0	2	0	0	2	6	6	13	1	20	3	0	0
S-11	2	1	2	0	2	3	10	7	4	2	13	2	0	0
S-12	1	0	1	0	0	0	2	4	9	2	15	6	0	0
S-13	9	0	0	0	0	4	13	0	7	6	15	2	0	0
S-14	0	0	3	1	1	1	6	6	4	4	17	4	0	0
S-15	2	4	1	0	0	4	11	6	5	2	12	3	1	0
S-16	5	0	1	0	2	4	12	5	12	3	13	3	0	0
S-17	2	0	3	0	0	2	7	2	7	1	15	1	1	0
S-18	1	1	2	0	0	2	6	5	4	6	18	1	0	0
S-19	3	0	1	0	1	3	8	2	3	1	7	5	1	0
S-20	5	0	4	1	0	2	12	3	9	6	12	1	1	0
S-21	0	0	1	0	0	0	1	2	3	3	14	3	0	0
S-22	0	0	0	0	0	9	9	1	0	5	9	2	0	0
S-23	1	0	4	0	2	2	9	7	0	10	17	2	0	0
S-24	0	1	0	0	0	3	4	2	11	5	18	2	1	0
S-25	2	0	1	1	0	3	7	7	2	3	12	3	0	0

TABLE 12 (continued)

MAL	DES	FAIL	BIZ	WITH	R	AIRT	H-L	PATH	$(1 - \frac{INT}{ENV})^2$
0	1	0	0	1	30	8.53	18	2	.04
5	10	0	0	10	30	5.57	9	25	.56
3	4	0	0	4	30	13.90	26	11	5.76
4	1	1	1	3	29	14.07	50	10	13.10
2	5	0	0	5	30	8.36	15	12	.77
7	2	0	0	2	30	9.01	25	11	.14
3	6	1	0	6	29	7.43	44	15	.25
5	0	0	2	2	30	5.67	11	9	.42
1	0	0	0	0	30	9.01	20	1	.08
3	0	1	0	1	29	15.41	48	5	.49
2	4	0	1	5	30	10.60	32	12	.08
6	6	1	0	7	29	6.24	16	20	.76
2	0	0	0	0	30	7.23	19	2	.02
4	2	1	0	3	29	8.86	22	10	.42
4	3	0	0	3	30	6.29	19	10	.01
3	2	0	0	2	30	7.03	27	7	.01
2	5	0	1	6	30	17.80	49	14	.28
1	4	0	1	5	30	10.76	14	15	.45
6	7	0	2	9	30	11.70	47	24	.74
2	4	0	0	4	30	11.63	23	10	.00
3	12	0	0	12	30	10.43	34	27	.86
2	10	0	0	10	30	8.63	30	22	.00
2	2	0	0	2	30	8.30	30	6	.22
3	5	0	0	5	30	9.96	18	13	.61
3	8	0	0	8	30	18.83	60	19	.18

TABLE 13

ITEM ANALYSIS OF RESPONSES ON THE MODIFIED HAND TEST

- UNSUCCESSFUL -

Subj.	AFF	DEP	COM	EXH	DIR	AGG	INT	ACQ	ACT	PAS	ENV	TEN	CRIP	FEAR
S-26	0	0	7	0	0	0	7	6	3	1	10	7	0	0
S-27	7	2	0	3	0	5	17	2	3	2	7	2	4	0
S-28	0	0	0	3	0	0	3	8	3	1	12	3	6	0
S-29	0	0	1	0	0	2	3	2	1	1	4	4	4	0
S-30	5	1	3	1	0	10	20	0	4	2	6	2	0	1
S-31	1	0	2	1	0	1	5	9	3	2	14	4	0	0
S-32	1	0	1	0	0	0	2	13	3	4	20	4	0	0
S-33	5	0	4	0	4	2	15	4	0	4	8	2	0	0
S-34	1	1	4	0	0	0	6	1	3	4	8	11	0	0
S-35	1	0	4	7	0	2	14	0	1	0	1	0	12	0
S-36	0	0	0	0	0	0	0	15	3	1	19	8	0	0
S-37	0	1	0	0	0	0	1	0	11	2	13	0	0	0
S-38	4	0	1	0	1	4	10	1	2	3	6	2	0	0
S-39	0	1	1	3	2	1	8	11	3	2	16	2	0	0
S-40	0	0	0	0	0	2	2	2	4	5	11	4	2	0
S-41	0	1	0	2	0	0	3	3	6	3	12	5	0	0
S-42	5	2	2	0	0	1	10	3	6	5	14	4	1	0
S-43	5	0	1	0	0	2	8	16	2	3	21	0	0	0
S-44	0	0	0	0	0	3	3	0	1	0	1	1	1	0
S-45	5	1	0	0	9	3	18	0	2	0	2	1	1	0
S-46	3	0	1	1	0	2	7	5	7	1	13	8	0	0
S-47	3	0	0	0	0	2	5	1	17	1	19	2	2	0
S-48	4	0	0	0	0	3	7	12	0	2	14	4	3	0
S-49	0	0	0	0	0	1	1	2	4	0	6	1	20	0
S-50	1	0	1	0	0	0	2	7	5	2	14	3	0	0

TABLE 13 (continued)

MAL	DES	FAIL	BIZ	WITH	R	AIRT	H-L	PATH	$(1 - \frac{INT}{ENV})^2$
7	4	0	2	6	30	9.17	25	19	.09
6	0	0	0	0	30	6.03	11	6	2.46
9	1	3	2	6	27	12.11	16	21	.56
8	14	0	1	15	30	5.70	9	38	.06
3	1	0	0	1	30	8.30	22	5	7.13
4	3	4	0	7	26	14.87	32	18	.41
4	4	0	0	4	30	19.50	81	12	.81
2	4	1	0	5	29	12.27	25	12	.77
11	5	0	0	5	30	6.33	12	16	.63
12	3	0	0	3	30	8.03	15	18	169.00
8	2	1	0	3	29	15.76	14	0	1.00
0	16	0	0	16	30	11.80	35	32	.85
2	12	0	0	12	30	5.80	8	26	.99
2	4	0	0	4	30	4.70	8	10	.25
6	4	2	5	11	28	6.78	18	28	.67
5	9	1	0	10	29	9.82	26	25	.56
5	1	0	0	1	30	7.00	10	7	.08
0	1	0	0	1	30	9.93	28	2	.38
2	15	6	3	24	24	13.95	27	50	4.00
2	8	0	0	8	30	6.00	26	18	64.00
8	0	0	2	2	30	6.20	23	12	.21
4	0	2	0	2	28	17.00	48	8	.55
7	1	0	1	2	30	10.40	80	11	.25
21	1	0	1	2	30	6.40	9	25	.69
3	11	0	0	11	30	10.03	38	25	.74

TABLE 14
SCORES OF SUCCESSFUL WORK-STUDY STUDENTS
ON THE PICTORIAL STUDY OF VALUES

Subject	Aesthetic	Economic	Political	Religious	Social	Theoretical	Genlike
S-1	50	30	47	36	18	49	15
S-2	60	27	40	30	16	56	5
S-3	49	23	45	52	55	34	21
S-4	62	33	47	41	36	36	13
S-5	51	28	54	42	31	32	18
S-6	59	24	47	36	36	40	21
S-7	54	27	37	36	34	42	7
S-8	55	24	48	37	40	29	17
S-9	60	24	37	33	14	46	10
S-10	61	28	36	27	23	45	6
S-11	51	19	51	38	29	44	21
S-12	51	21	48	42	44	44	23
S-13	55	26	50	30	41	52	26
S-14	48	20	60	43	68	32	55
S-15	61	16	51	46	64	28	43
S-16	47	35	53	38	26	56	18
S-17	54	23	66	40	43	43	28
S-18	60	30	42	36	34	46	11
S-19	65	30	38	27	30	49	4
S-20	48	25	52	42	35	50	9
S-21	47	27	41	35	36	49	16
S-22	57	30	42	35	25	48	6
S-23	49	22	38	40	46	36	18
S-24	45	29	48	40	29	48	16
S-25	38	29	50	40	43	47	26

TABLE 15
SCORES OF UNSUCCESSFUL WORK-STUDY STUDENTS
ON THE PICTORIAL STUDY OF VALUES

Subject	Aesthetic	Economic	Political	Religious	Social	Theoretical	Genlike
S-26	44	27	49	44	37	46	18
S-27	56	23	49	38	53	37	34
S-28	64	23	51	35	51	34	31
S-29	56	17	46	48	44	44	24
S-30	67	26	50	34	27	38	17
S-31	68	25	43	32	23	43	10
S-32	58	22	42	51	53	40	21
S-33	45	21	54	49	57	37	48
S-34	55	17	45	32	48	42	38
S-35	53	29	35	37	33	39	14
S-36	51	24	54	50	51	33	37
S-37	60	28	33	47	40	41	9
S-38	63	20	55	39	37	36	31
S-39	62	31	47	32	18	62	17
S-40	52	24	44	40	39	47	3
S-41	54	20	44	45	65	26	39
S-42	53	28	56	38	34	47	24
S-43	60	28	47	31	34	48	6
S-44	37	31	44	55	48	40	19
S-45	73	32	36	28	14	54	1
S-46	42	21	44	52	48	39	24
S-47	48	21	50	49	53	31	23
S-48	51	25	46	31	27	43	9
S-49	66	27	59	48	44	36	22
S-50	56	21	42	44	52	36	21

TABLE 16

ANALYSIS OF MALE, FEMALE AND CHILD CARDS AND THE ACT SCORING CATEGORY ON THE MODIFIED HAND TEST SUCCESSFUL AND UNSUCCESSFUL SUBJECTS

Successful Subjects	Male ACT R's	Female ACT R's	Child ACT R's	Total ACT R's	Unsuccessful Subjects	Male ACT R's	Female ACT R's	Child ACT R's	Total ACT R's
S-1	2	3	0	5	S-26	2	1	0	3
S-2	0	1	1	2	S-27	0	2	1	3
S-3	0	1	0	1	S-28	0	1	2	3
S-4	0	4	2	6	S-29	1	0	0	1
S-5	2	3	1	6	S-30	1	3	0	4
S-6	1	3	0	4	S-31	1	1	1	3
S-7	0	2	2	4	S-32	1	0	2	3
S-8	0	0	0	0	S-33	0	0	0	0
S-9	4	2	4	10	S-34	0	0	3	3
S-10	4	5	4	13	S-35	0	1	0	1
S-11	0	1	3	4	S-36	1	2	0	3
S-12	1	4	4	9	S-37	1	5	4	11
S-13	2	4	3	9	S-38	0	2	0	2
S-14	0	5	2	7	S-39	0	1	2	3
S-15	1	2	1	4	S-40	2	2	0	4
S-16	2	2	1	5	S-41	1	3	2	6
S-17	2	6	4	12	S-42	0	4	2	6
S-18	0	3	4	7	S-43	0	1	1	2
S-19	1	1	2	4	S-44	0	1	0	1
S-20	1	1	1	3	S-45	1	1	0	2
S-21	4	3	2	9	S-46	2	1	4	7
S-22	1	1	1	3	S-47	5	5	7	17
S-23	0	0	0	0	S-48	0	0	0	0
S-24	3	4	4	11	S-49	2	2	0	4
S-25	0	2	0	2	S-50	1	2	2	5

APPENDIX B

Dear Teacher Coordinator:

Enclosed is a rating sheet to be used in connection with a research project being conducted at the University of Oklahoma. All of the information will be kept confidential and the students will be referred to only by numbers in the study.

Do NOT include any of the following students:

1. ninth grade students
2. those who have been in the program for less than 30 days
3. any student who is not physically able to work
4. those students who will not be available for testing at a later date (during the first two weeks of May, 1973)

After determining those students who are to be used in this survey, please list your students in descending order, the most successful worker to the least successful worker in your program. When rating these students, keep the following criteria in mind:

Social Adjustment Criteria

- Self-confidence
- Cheerfulness
- Cooperation with supervisor
- Cooperation with fellow employees
- Respects authority
- Minds own business
- Accepts criticism
- Mixes socially with employees
- Neat and clean

Work Habit Criteria

- On time
- Careful with materials
- Completes work on time
- Work is of good quality
- Understands work
- Shows initiative

When you have finished rating your Work-Study students please return the rating form in the enclosed, self-addressed stamped envelope. Your cooperation and effort will help to provide data with which to better evaluate the psychological needs of your students. Thank you for your cooperation.

Sincerely yours,

Russell A. Hardesty

Please rate your students in descending order, most successful to least successful

______________________________ ______________________________
Name of school Teacher Coordinator

NAME OF STUDENT	SEX	RACE	AGE	GRADE	I.Q.

APPENDIX C

Card - 30
Male Set

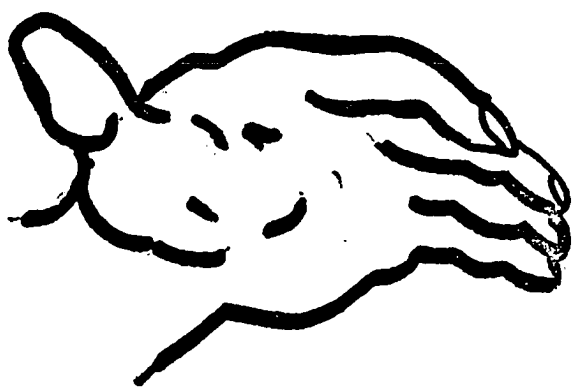
Card - 23
Male Set

Card - 12
Male Set

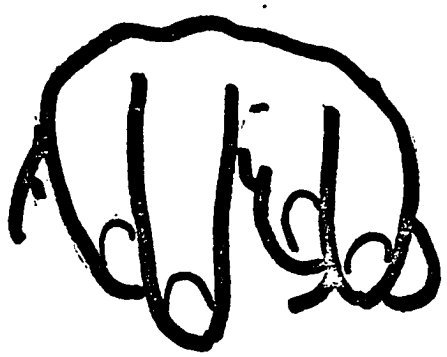
Card - 17
Male Set

Card - 14
Male Set

Card - 28
Male Set

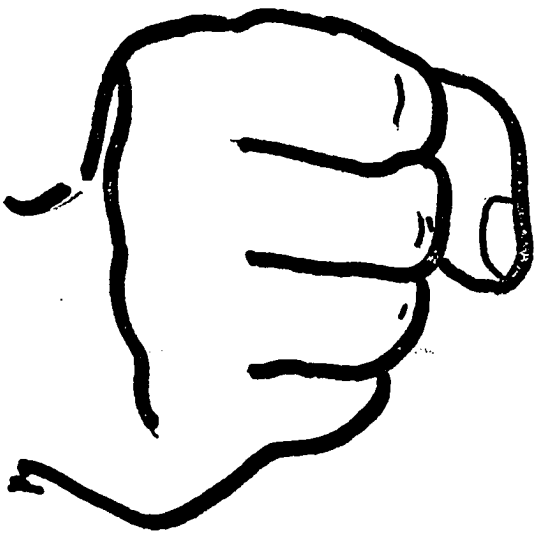


Card - 21
Male Set

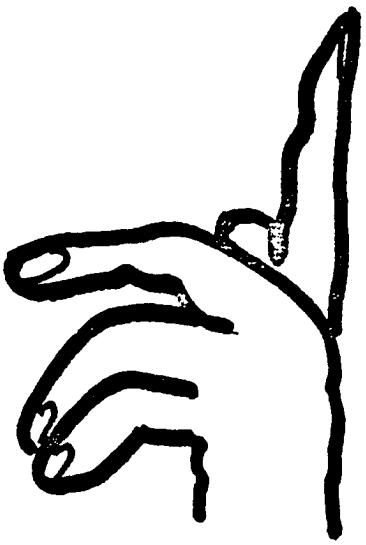


Card - 26
Male Set

Card - 19
Male Set



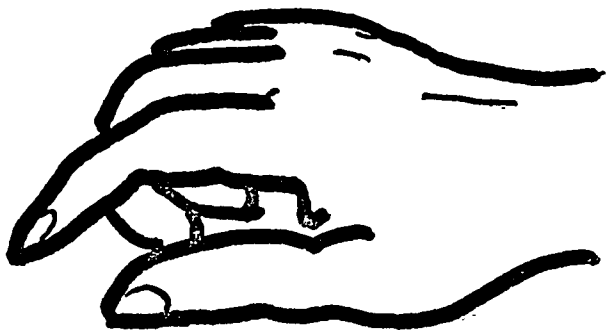
Card - 9
Male Set



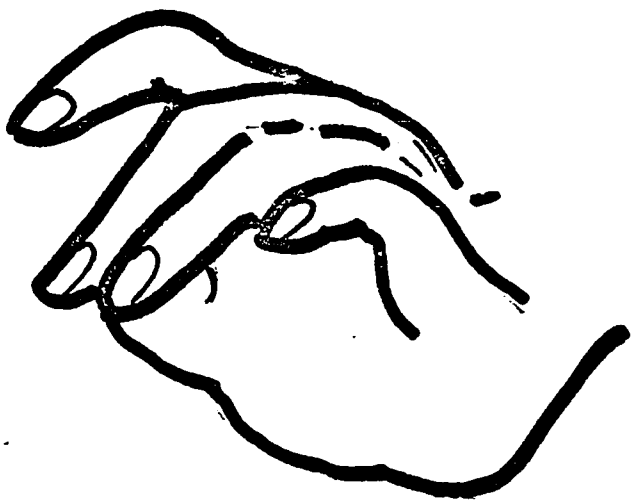
Card - 22
Female Set

Card - 16
Female Set

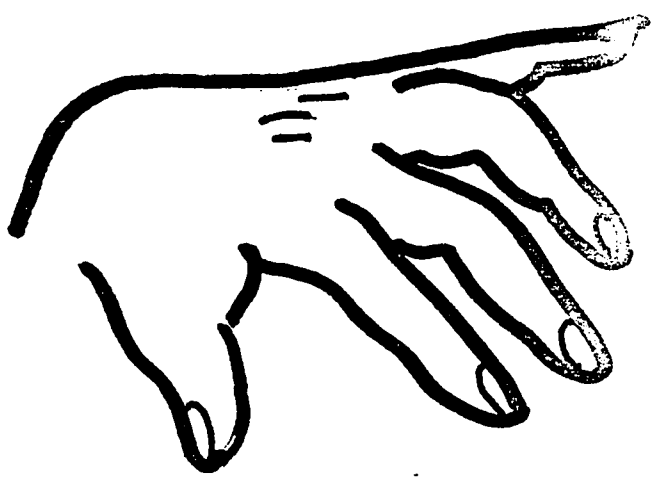
Card - 3
Female Set



Card - 1
Female Set

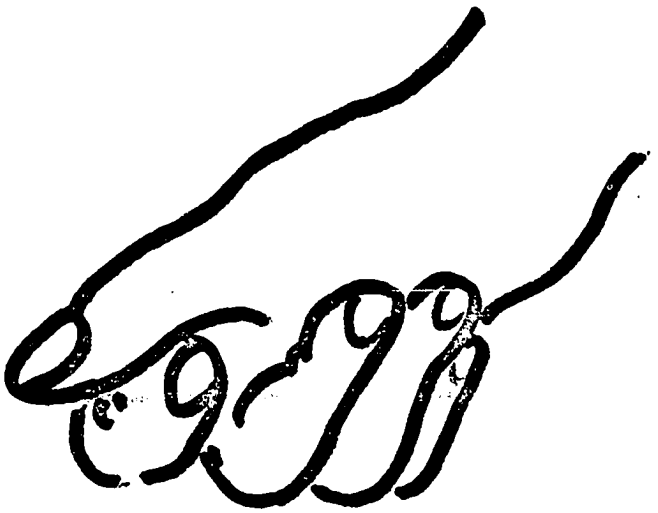


Card - 5
Female Set

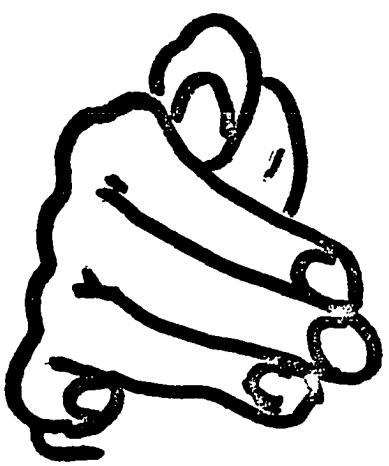


Card - 20
Female Set

Card - 7
Female Set

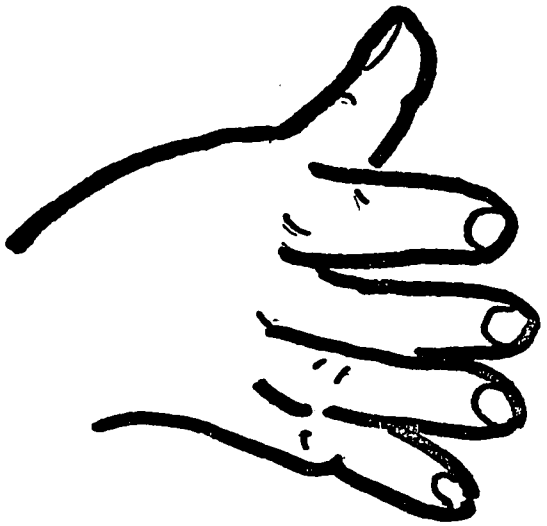


Card - 27
Female Set



Card - 10
Female Set

Card - 24
Female Set

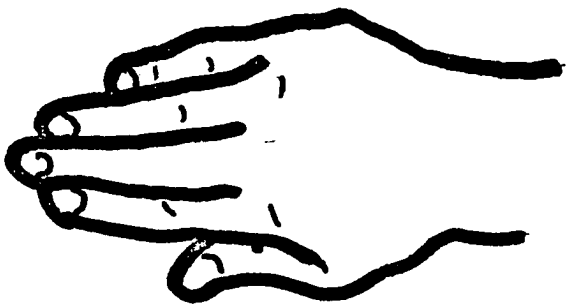


Card - 18
Child Set

Card - 4
Child Set

Card - 15
Child Set

Card - 11
Child Set

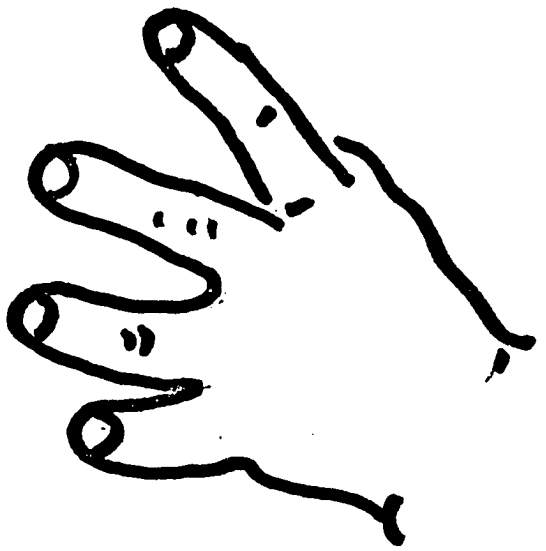


Card - 6
Child Set

Card - 2
Child Set

Card - 13
Child Set

Card - 29
Child Set



Card - 25
Child Set

Card - 8
Child Set